

Having thus described our invention, what is claimed is:

1) A pig apparatus for removing deposits from the interior surface of a conduit while being advanced through said conduit by impetus provided by an upstream activating liquid of adjustable pressure and flow exerting a primary operating pressure upon said apparatus, said apparatus comprising:

a) a rear assembly bounded by upstream and downstream faces and a circular cylindrical sidewall, thereby defining an interior region, and intensifier means located in said interior region for increasing said primary operating pressure to a second operating pressure,

b) a front assembly bounded by front and rear faces in spaced apart parallel relationship on a centered axis and a pliable circular cylindrical sidewall having an outside diameter that closely matches the diameter of the interior surface of said conduit and is outwardly expandable by pressure applied from within said front assembly, said front face having nozzle means adapted to rotate upon said axis under the impetus of said second operating pressure liquid, said nozzle means having a forward extremity equipped with a plurality of orifices which produce high velocity jets of liquid directed toward said interior surface,

c) valved flow control means which divert a portion of the liquid at said second operating pressure, causing said diverted liquid to have a third operating pressure which is less than said second operating pressure but higher

than said primary pressure, and causing said third operating pressure liquid to activate said pliable sidewall, and

5 d) coupling means interactive between the downstream face of said rear assembly and the rear face of said front assembly for facilitating transfer of liquid at said second and third operating pressure and permitting limited movement between said front and rear assemblies.

10 2) The apparatus of claim 1 wherein said intensifier means comprises at least one piston device and cylinder assembly.

3) The apparatus of claim 2 having two piston device and cylinder assemblies, said assemblies being interactive in a reciprocating manner.

15 4) The apparatus of claim 1 wherein said second operating pressure is between 3 and 5 times greater than said primary operating pressure.

20 5) The apparatus of claim 1 wherein the orifices of said nozzle means are disposed in angular relationship to said axis, whereby the emergent high velocity jets cause rotation of said nozzle means.

6) The apparatus of claim 1 further comprising a pliable circular cylindrical sidewall in said rear assembly outwardly expandable by liquid at said third operating pressure.

25 7) The apparatus of claim 1 further comprising a holding chamber for liquid at said second operating pressure.

8) The apparatus of claim 7 wherein said holding chamber is located within said rear assembly.

- 9) The apparatus of claim 1 wherein said pliable sidewall is fabricated of a resilient material having a coefficient of friction with respect to the interior surface of said conduit of between 0.3 and 0.5.
- 5 10) The apparatus of claim 3 wherein said piston devices and associated cylinders are of stepped configuration wherein a large diameter rear piston portion and associated large cylinder portion is contiguous with a forwardly located narrow diameter piston portion and associated narrow diameter cylinder portion.
- 10 11) The apparatus of claim 10 wherein a passage equipped with a check valve extends through the rear portion of said piston devices to allow upstream activating liquid at said primary operating pressure to enter the associated large cylinder portion.
- 15 12) The apparatus of claim 3 wherein a poppet piston is slideably positioned within each piston device and adapted to permit controlled bypass of liquid between the rear and forwardly located extremities of the piston device.
- 20 13) The apparatus of claim 1 wherein said pliable sidewall, when outwardly expanded by said third operating pressure, exerts a breaking force upon the interior surface of said conduit which is sufficient to prevent forward motion of the apparatus along the conduit at a chosen primary operating pressure.
- 25 14) The apparatus of claim 13 wherein forward motion of said apparatus may be achieved by an increase in said primary operating pressure.